

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-259 066-T

Methodology for Studying the Molecular Structure of Coals and Humic Acids

Environmental Protection Agency, Research Triangle Park, N C

1972

300081

PB 259 066-T

EPA -TR 76-300

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OF COALS AND HUMIC ACIDS

[Metodika issledovaniya molekulyarnogo stroyeniya
ugley i guminovykh kislot]

Uzbekskiy khimicheskiy zhurnal, Vol. 16, No. 3,
1972, pp. 65-66.

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

Translated for the
ENVIRONMENTAL PROTECTION AGENCY

by

Translation Consultants, Ltd., Arlington, Virginia 22204

BIBLIOGRAPHIC DATA SHEET		1. Report No. EPA TR76-300	2.	3. Recipient's Accession No.
4. Title and Subtitle Methodology for studying the molecular structure of coals and humic acid				5. Report Date 1972
7. Author(s) D.T. Zabramnyy, S. Nasritdinov, O.I. Pobedonostseva				6.
9. Performing Organization Name and Address TRANSLATED FROM RUSSIAN BY EPA Translation Service Office of Administration Library Research Triangle Park, NC 27711				8. Performing Organization Rept. No.
12. Sponsoring Organization Name and Address				10. Project/Task/Work Unit No.
				11. Contract/Grant No.
				13. Type of Report & Period Covered
				14.
15. Supplementary Notes UZBEKSKIY KHIMICHESKIY ZHURNAL 16(3): 1972, pp.65-66.				
16. Abstracts				
17. Key Words and Document Analysis. 17a. Descriptors EPAISD				
17b. Identifiers/Open-Ended Terms NONRENEWABLE RESOURCES LABORATORY TECHNOLOGY				
17c. COSATI Field/Group 97C		99F		PRICES SUBJECT TO CHANGE
18. Availability Statement THIS TRANSLATION WAS MADE FROM A NON-COPYRIGHTED TEXT.		19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 5	22. Price 3.50/3.00
		20. Security Class (This Page) UNCLASSIFIED		

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METHODOLOGY FOR STUDYING THE MOLECULAR STRUCTURE
OF COALS AND HUMIC ACIDS

The molecular structure of coals* and humic acids is studied by destroying the individual links in the molecules, avoiding their decomposition and taking the characteristics of the products into consideration.

The process is carried out in steps, or by gradually increasing the rigidity of the conditions, by a combination of reducing and oxidizing methods.

Reduction destruction of coals and humic acids can be accomplished by hydrogenation at various temperatures using a known procedure [1, 2]. Yield, structural-group composition, and the characteristics of the hydrogenators (including insoluble residues and gaseous products) in combination with the chemical characteristics of the original substance, provide the means for arriving at the heterocycles, the condensed aromatic and naphthein rings in the link, as well as the number of links per conventional macromolecule of coals and per molecular mass of a mixture of humic acids. A tentative model of their structure can be constructed on the basis of the results obtained.

Yield and characteristics of the products of oxidation at each step in the case of step oxidation destruction of KMnO_4 in an alkaline medium [3] also can be taken into consideration, and the quantity of benzene carboxylic and products of the reduction of polycarboxylic acids can be determined by gas-liquid chromatography.

*What is meant is homogeneous petrographic ingredients.

Obtained in addition to the supplemental information on the structure of the nuclear section of the links and the number of such links in the conventional molecule, are data on the presence in highly condensed links of molecules of coals and humic acids of the structures of the configuration of the disantene or pyrene series [4], something that is difficult to judge from the products of reduction destruction.

Fractionation vacuum distillation of hydrogenators will be undertaken in the future. The hydrogenators will be separated by thin-layer or column and preparative subfractionation chromatography of the individual substances, or of substances that closely resemble them in structure. Products will be studied by using mass, infrared, ultraviolet, and quasilinear spectroscopy, gas-liquid chromatography, nuclear magnetic resonance, electron paramagnetic resonance, and other methods.

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Submitted 18 February 1972